UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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November 15, 2010

Chief, Rulemaking and Directives Branch
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: EPA Review and Comments
Draft Supplemental Environmental Impact Statement (DSEIS) for the
Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4
Construction and Operation, Application for Combined Licenses (COLs), NUREG-1947
CEQ No. 20100351

Dear Sir:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Supplemental Environmental Impact Statement (DSEIS) for the Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4, pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA), and Section 309 of the Clean Air Act. The purpose of this letter is to inform you of the results of our review, and our detailed comments are enclosed.

Southern Nuclear Operating Company, Inc. (Southern) and four co-applicants applied for combined construction permits and operating licenses (combined licenses or COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4. The proposed action is NRC issuance of COLs for two new nuclear power reactor units (Units 3 and 4) at the VEGP site near Waynesboro, Georgia.

EPA previously reviewed and submitted written comments regarding the Draft and Final Environmental Impact Statements (EISs) for the Early Site Permit (ESP) for the new units, and for the Joint Public Notice for the U.S. Army Corps of Engineers (USACE) Permit. Since these documents stated that there were no transmission line impacts, our comments at that time pertained to the plant site only. The USACE permit action on an Individual Permit application pursuant to Section 404 of the Clean Water Act, and Section 401 water quality certification for the Plant VEGP expansion were finalized in September 2010. The current DSEIS provides updated information and focuses on the proposed issuance of the COLs to authorize construction and operation of the new units and ancillary facilities.

The NRC issued an Early Site Permit (ESP) on August 26, 2009, approving the VEGP site as suitable for the construction of Units 3 and 4. NRC issuance of a Limited Work Authorization

(LWA) enabled specific pre-construction activities at the site to begin. The NRC is currently reviewing the Westinghouse AP1000 pressurized reactor design in a design certification process.

Radioactive waste storage and disposal are ongoing concerns with existing and proposed nuclear power plants. The NRC approved final revisions to the Waste Confidence findings and regulation (10 CFR Part 51.23) in September 2010. This update expresses confidence that commercial high-level radioactive waste and spent fuel generated by any reactor *"...can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor."* This refers to storage in a spent fuel basin or at either onsite or offsite independent spent fuel storage installations.

Since appropriate storage of spent fuel assemblies and other radioactive wastes is necessary to prevent environmental impacts, the FSEIS should provide a thorough consideration of impacts resulting from such storage. Given the uncertainty regarding ultimate disposal at a repository, on-site storage may continue for many years.

Southern indicated that there would be an operations-related three percent increase in the thermal discharge flow in the DSEIS. The NRC determined that the thermal plume would remain small compared to the width of the Savannah River at this location, and that it would not impede fish passage in the river. The Final Supplemental Environmental Impact Statement (FSEIS) should include a graph of the plume showing the temperature profile, and a discussion of how the increase will (or will not) cause a violation of Georgia's water quality standard for temperature at the point of discharge.

In addition, the design and location of the proposed new cooling water intake structure has changed. The NRC determined that this new location would not alter conclusions presented in the previous ESP FEIS. Continuing measures to limit bioentrainment and other impacts to aquatic species from surface water withdrawals and discharges should be referenced in the FSEIS, and should continue to be addressed as the project progresses, in compliance with the NPDES Permit.

The FSEIS should include further information regarding plans to reduce Greenhouse Gases (GHGs) and other air emissions during construction of the facility. Specifically, energy efficiency and renewable energy should be a consideration in the construction and operation of facility buildings, equipment, and vehicles. We also recommend that the FSEIS explicitly reference the draft guidance from CEQ related to evaluating GHGs in Federal actions, describe the elements of the draft guidance, and to the relevant extent, provide the assessments suggested by the guidance. Based on your analysis using the CEQ NEPA Guidance, further data collection may be necessary in the future.

Based on EPA's review of the DSEIS, the document received a rating of EC-2, meaning that the EPA review identified environmental concerns. (A summary of EPA's rating definitions is enclosed.) In particular, EPA recommends that the FSEIS include updated information about radioactive waste storage and disposal, impacts of macro-right-of-way transmission lines, a consideration of GHGs using CEQ's draft guidance for GHGs, and a discussion of opportunities to reduce GHG and other air emissions during construction and operation of the facility. In

addition, the FSEIS should include a status update regarding the Westinghouse AP1000 certification review.

Thank you for your continuing coordination with us. We look forward to reviewing the FSEIS. If you have any questions or need additional information, please contact Ramona McConney of my staff at (404) 562-9615.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

Enclosures: EPA Review and Comments
Summary of Rating Definitions and Follow Up Action

EPA Review and Comments Regarding
Draft Supplemental Environmental Impact Statement (DSEIS) for the
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General

This DSEIS provides updated information (subsequent to the ESP FEIS) regarding preconstruction activities and environmental data, and focuses on the proposed issuance of COLs for the two new reactor units and ancillary facilities.

In the DSEIS, the NRC concludes that there are no new and significant data or changes to conclusions since the ESP FEIS regarding the following: land-use impacts, meteorology and air quality impacts, water quality impacts, terrestrial and aquatic ecosystems, socioeconomic impacts, historic and cultural resource impacts, environmental justice, nonradiological health impacts, radiological impacts of normal operations, environmental impacts of postulated accidents.

Alternatives

Alternatives in the DSEIS include the no-action alternative, energy source alternatives and system design alternatives. The NRC's evaluation of alternative sites is documented in the EIS for the ESP, which EPA previously reviewed and submitted comments.

Radioactive wastes

Appropriate on-site storage of spent fuel assemblies and other radioactive waste is necessary to prevent environmental impacts. Given the uncertainty regarding ultimate disposal at a repository, on-site storage may continue for a longer term than currently expected.

Yucca Mountain was formerly considered a possible final repository for spent nuclear fuel, but this plan was withdrawn by the U.S. Department of Energy by the motion of March 3, 2010. The abandonment of the plan to create a Yucca Mountain permanent geologic repository has been recently countered by NRC's Atomic Safety and Licensing Board. If another repository in the contiguous United States (other than Yucca Mountain) is ever selected, the environmental impact estimates from the transportation of spent reactor fuel to the repository should be calculated as required under 42 USC 4321 Fuel Cycle, Transportation, and Decommissioning.

In the Waste Confidence Rule (10 CFR 51.23), the Commission generically determined that the spent fuel generated by any reactor can be safely stored on-site for at least 30 years beyond the licensed operating life of the reactor. The NRC approved final revisions to the Waste Confidence findings and regulation in September 2010, extending the storage period until *"...30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor"* in its spent fuel basin or at either onsite or offsite independent spent fuel storage installations.

The FSEIS should clarify the impact of this revision on the proposed project, as this new determination finds that spent nuclear fuel can be stored safely and securely without significant environmental impacts for at least 60 years after operation at any nuclear power plant. EPA recommends that the FSEIS cite any new analyses for longer-term storage regarding scientific knowledge relating to spent fuel storage and disposal. The FSEIS should also mention any developments with the Presidential Blue Ribbon Commission on alternatives for dealing with high-level radioactive waste, if there are such updates before FSEIS publication.

We understand that shipping casks have not yet been designed for the spent fuel from advanced reactor designs such as the Westinghouse AP1000. Information in the Early Site Permit Environmental Report Sections and Supporting Documentation (INEEL 2003) indicated that advanced light water reactor (LWR) fuel designs would not be significantly different from existing LWR designs; therefore, current shipping cask designs were used for the analysis of Westinghouse AP1000 reactor spent fuel shipments. EPA recommends that when shipping casks are designed for the spent fuel for the Westinghouse AP1000, the analysis should be repeated.

EPA understands that concerns have been raised by the NRC that certain structural components of the revised AP1000 shield building may not be suitable to withstand design loads. The shield building is designed to protect the reactor's primary containment from severe weather and other events, as well as serving as a radiation barrier and also supporting an emergency cooling water tank. It is EPA's understanding that the NRC is currently reviewing the remainder of the next-generation reactor's design certification amendment application, and that Westinghouse is expected to make design modifications and conduct safety testing to ensure the shield building design can meet its safety functions.

The FSEIS should address the status of the Westinghouse AP1000 certification review and related issues, particularly the analysis of the structural integrity of the AP1000. We understand that the Safety Evaluation Report will address these issues in even more detail, and that the certification review may be completed as soon as December 2010. EPA understands that Revision 15 of the AP1000 design is codified in 10 CFR Part 52, Appendix D. EPA concurs with NRC's plan to conduct an additional environmental review if changes result in the final design being significantly different from the design considered in the DEIS.

Transmission lines

We note that the NRC considers transmission lines to be "preconstruction" activities (discussed in the EIS for the ESP), and that preconstruction activities are considered in the context of cumulative impacts. EPA is concerned about the impacts of transmission lines and supporting infrastructure for the project and, in accordance with NEPA, considers these activities as part of the project, and not a separate action.

The DSEIS (pages 3-7 and 3-8) discusses the construction of a new transmission line through a "macro-right-of-way." This term should be defined in the text, with details given regarding the proposed extent and impacts of this new transmission line. The FSEIS should also clarify whether there are plans to issue a Limited Work Authorization (LWA) for these lines pursuant to the NRC's LWA process.

Wetlands and Streams

Jurisdictional determinations for all site wetlands are complete, with the exception of the required metes and bounds survey. A joint application package was submitted for all permits under the jurisdiction of the USACE (Section 404, Section 10, and Dredge and Fill) on January 7, 2010.

EPA reviewed the impacts to wetlands and streams in response to the USACE's public notice for the Clean Water Act Section 404 permit application, and transmitted a comment letter in accordance with Section 404 coordination procedures. We note that the Dredge and Fill discharge permit was for the transmission line corridor.

NPDES Permitting

Southern indicated that there would be an operations-related three percent increase in the thermal discharge flow. The NRC determined that the thermal plume would remain small compared to the width of the Savannah River at this location, and that it would not impede fish passage in the river (Section 5.4.2). In addition, the design and location of the proposed new cooling water intake structure has changed. The NRC determined that this new location would not alter conclusions in the previous ESP FEIS. Pursuant to our review, the following areas need clarification:

- *Temperature:* The discussion of the 3% increase in the thermal discharge should include a graph of the plume showing the temperature profile, and a discussion of how the increase will (or will not) cause a violation of Georgia's water quality standard for temperature at the point of discharge.

- *Cooling Water Intake:* For clarity, the FSEIS should restate the requirements for the cooling water intake structure.

Greenhouse Gases (GHGs)

We appreciate your discussion of climate change and GHGs in the DSEIS. The DSEIS states that the majority of the potential carbon dioxide (CO_2) emissions of the proposed nuclear power plant would be the life cycle contributions associated with the uranium fuel cycle (Section 7.2). The DSEIS notes that such emissions primarily result from the operation of fossil-fueled power plants that provide the electricity needed to manufacture the nuclear fuel.

CEQ Draft Guidance on GHG Analysis within NEPA: On February 18, 2010, the Council on Environmental Quality (CEQ) proposed four steps to modernize and reinvigorate NEPA. In particular, the CEQ issued draft guidance for public comment on, among other issues, when and how Federal agencies must consider greenhouse gas emissions and climate change in their proposed actions.
(Reference: http://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa)

The draft guidance explains how Federal agencies should analyze the environmental impacts of greenhouse gas emissions and climate change when they describe the environmental impacts of a

proposed action under NEPA. It provides practical tools for agency reporting, including a presumptive threshold of 25,000 metric tons of carbon dioxide equivalent ($C0_2e$) emissions from the proposed action to trigger a quantitative analysis, and instructs Federal agencies regarding how to assess the effects of climate change on the proposed action and their design. The draft guidance does not apply to land and resource management actions and does not propose to regulate greenhouse gases.

While this guidance is not yet final (and thus, not required), we recommend that the FSEIS explicitly reference the draft guidance, describe the elements of the draft guidance, and to the relevant extent, provide the assessments suggested by the guidance. (Note that the discussion in Section 7.2 and referencing the Sovacool paper (see footnote 1 below) regarding the derivation of 447,000 metric tons/year of CO_2 emissions from a 1000 MW nuclear power plant is difficult to follow. For example, we could not find the "1 percent to 5 percent" citation noted as being in the Sovacool paper. It would be helpful to show a detailed derivation of the amount of direct and indirect CO_2-equivalent emissions expected specifically from this project.)

EPA also recommends a discussion of best management practices (BMPs) to reduce GHGs and other air emissions during construction and operation of the facility. Specifically, clean energy options such as energy efficiency and renewable energy should be a consideration in the use of construction and maintenance equipment and vehicles. For example, equipment and vehicles that use conventional petroleum (e.g., diesel) should incorporate clean diesel technologies and fuels to reduce emissions of GHGs and other pollutants, and should adhere to anti-idling policies to the extent possible. Alternate fuel vehicles (e.g., natural gas, electric) are also possibilities.

(1) Sovacool, BK. Valuing the Greenhouse Gas Emissions for Nuclear Power: A Critical Survey. Energy Policy 36 (2008) 2940 - 2953.

Diesel Exhaust

In addition to the EPA's concerns regarding climate change effects and GHG emissions, the National Institute for Occupational Safety and Health (NIOSH) has determined that diesel exhaust is a potential human carcinogen, based on a combination of chemical, genotoxicity, and carcinogenicity data. In addition, acute exposures to diesel exhaust have been linked to health problems such as eye and nose irritation, headaches, nausea, and asthma.

Although every construction site is unique, common actions can reduce exposure to diesel exhaust. EPA recommends that the following actions be considered for construction equipment:

- Using low-sulphur diesel fuel (less than 0.05% sulphur).
- Retrofit engines with an exhaust filtration device to capture DPM before it enters the workplace.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, thereby reducing the fume concentration to which personnel are exposed.
- A catalytic converter reduces carbon monoxide, aldehydes, and hydrocarbons in diesel fumes. These devices must be used with low sulphur fuels.
- Ventilate wherever diesel equipment operates indoors. Roof vents, open doors and windows, roof fans, or other mechanical systems help move fresh air through work areas.

As buildings under construction are gradually enclosed, remember that fumes from diesel equipment operating indoors can build up to dangerous levels without adequate ventilation.

- Attach a hose to the tailpipe of a diesel vehicle running indoors and exhaust the fumes outside, where they cannot reenter the workplace. Inspect hoses regularly for defects and damage.
- Use enclosed, climate-controlled cabs pressurized and equipped with high efficiency particulate air (HEPA) filters to reduce operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any air coming in is filtered first.
- Regular maintenance of diesel engines is essential to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance. For example, blue/black smoke indicates that an engine requires servicing or tuning.
- Work practices and training can help reduce exposure. For example, measures such as turning off engines when vehicles are stopped for more than a few minutes; training diesel-equipment operators to perform routine inspection and maintenance of filtration devices.
- When purchasing a new vehicle, ensure that it is equipped with the most advanced emission control systems available.
- With older vehicles, use electric starting aids such as block heaters to warm the engine, avoid difficulty starting, and thereby reduce diesel emissions.
- Respirators are only an interim measure to control exposure to diesel emissions. In most cases an N95 respirator is adequate. Respirators are for interim use only, until primary controls such as ventilation can be implemented. Workers must be trained and fit-tested before they wear respirators. Personnel familiar with the selection, care, and use of respirators must perform the fit testing. Respirators must bear a National Institute of Occupational Safety and Health (NIOSH) approval number. Never use paper masks or surgical masks without NIOSH approval numbers.

Endangered and Threatened Species

The DSEIS states that a biological assessment documenting potential impact on the federally listed threatened or endangered terrestrial special as a result of operation of the proposed new units and proposed transmission line is in development. The FSEIS should provided updated information on this assessment.

Historic Preservation

We appreciate the thorough discussion of cultural and historic resources in the DSEIS. Pursuant to the location of a historic cemetery on the VEGP site, Southern entered into a Memorandum of Understanding (SHPO) with the Georgia State Historic Preservation Office (SHPO). We also note SCE&G's cultural resources awareness training and inadvertent discovery procedure training for staff working at the site. The FSEIS should include an update of coordination activities with the SHPO.

SUMMARY OF RATING DEFINITIONS AND FOLLOW UP ACTION*

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impacts. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the Draft EIS sate, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1-Adequate

The EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alterative and those of the alternatives reasonably available to the project or action. No further analysis or data collecting is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for the EPA to fully assess the environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the Draft EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640 Policy and Procedures for the Review of the Federal Actions Impacting the Environment